



CHPS Implementation Approach

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Agenda

- CHPS is... & Accomplishments
- Key lessons learned
- Where are we today?
- Approach for upcoming projects
- AWIPS II
- CHPS approach to AWIPS II
- Next steps...



CHPS is...

- The “**C**ommunity **H**ydrologic **P**rediction **S**ystem”
- A multi-year effort to create an open, collaborative data and algorithm environment for hydrologic forecasting
- The approach for modernizing NWSRFS
- A vision, a set of technologies, and a community process



CHPS has evolved since 2002 with key accomplishments...

- Created prototype for unified logging and messaging (2002)
- Created proof-of-concept for unified process control (2003)
- Developed conceptual design of all key CHPS components (2004)
- Created proof-of-concept for format and location-independent data services (2005)
- Created initial design of standard hydrology XML schema, and formed the Hydrology XML Consortium (2005)
- Began evaluation of Delft-FEWS as a potential CHPS platform (2005)
- Continued development of XML schema and extended Consortium with additional members (2006)
- Formed CHPS Acceleration Team (2006)
- Used data services in DHM Build 1 (2006)



Key Lessons Learned

- Don't build and deliver CHPS components for their own sake; deliver value to the Field with CHPS components built in
- Wrapping NWSRFS code with CHPS services component is possible
- It won't always be best to wrap legacy code – in some cases, rewriting the logic will create more benefits and will avoid unnecessary complexity of wrapping



Where Are We Today?

- At crossroads whether to build CHPS fully custom or to use Delft-FEWS as the core platform
- At this point, we prefer to build on Delft-FEWS to gain schedule advantage and easier access to large number of available hydrology and other models
- Faced with working within the framework of AWIPS II software architecture refresh



Approach For Upcoming Projects

- Use ResSim opportunity to build in CHPS
 - ResSim Project
- Lay out roadmap of projects with CHPS built in
 - CHPS Realization Plan
- Determine if Delft-FEWS can host NWSRFS
 - Delft-FEWS Pilot
- Acquire new COTS models for NWSRFS
 - Model Expansion
- Continue Hydrology XML Consortium
 - HydroXC Phase 3



ResSim Project

- Objective: Define functional requirements and architectural design to integrate data flows between HEC's ResSim and NWSRFS
- Two phases:
 - Definition of solution
 - Implementation of solution
- Integrate via CHPS SOA Data & Algorithm Services
- Use Delft-FEWS to implement the needs of collaborative forecasting
- Assess experience with Delft-FEWS
- Apex/Delft contract task, started June 2006



CHPS Realization Plan

- Objective:
 - Elicit future RFC operations model based on CHPS
 - Define & prioritize needed software components to support that model
- Fully engage CHPS Acceleration Team
- Define role played by CHPS components to enable future operations model
- Establish specific sequence of projects to roll out CHPS components
- Deliver CHPS Realization Plan & work it!
- Apex contract task, July – October 2006



Delft-FEWS Pilot

- Objective: Evaluate FEWS integration capabilities
- Two phases:
 - Select NWSRFS component & geographic domain
 - Develop & exercise RFS/FEWS pilot
- Task goals:
 - Can Delft-FEWS implement CHPS SOA?
 - Can Delft-FEWS provide forecaster access to new & alternative hydrology models
 - Purchase Delft-SOBK development license for HSMB to evaluate
- RTi/Delft contract task, starting Summer 2006



Model Expansion

- Key goal of CHPS is to provide broad forecaster access to varied hydrology models
- Current desire to investigate usefulness of HEC-ResSim, HEC-RAS, and Delft-SOBEK
- Delft-FEWS infrastructure provides open interface to wide range of forecasting models
 - <http://www.wldelft.nl/soft/fews/int/index.html>



HydroXC Phase 3

- Objective: Continue to establish common hydrology data schema and related software components
- The “C” in CHPS is evolving from HydroXC
- Build upon basic schema and member collaborations from Phases 1 & 2
- Apex contract task, starting Summer 2006
- Continue forward in three key activity areas...



HydroXC Phase 3 (activities)

- Research
 - Begin dictionary of hydrologic objects with HydroXC members
 - Develop sub-schemas for typical data objects from basic schema
 - Publish short papers on work and findings
 - Adapt & evolve basic schema to version 3.0
- Development
 - Define requirements and develop data adapters to convert between HydroXC-compliant messages and SHEF & HEC-RAS formats
 - Incorporate data adapters into operational applications
- Community Building
 - Build HydroXC and join to CUASHI (Dr. Michael Piasecki)
 - Meet one-on-one with HydroXC members
 - Speak at conferences & present to NWS & NOAA
 - Create non-NWS stand-alone web site, www.HydroXC.org



AWIPS II Basic Approach

- Raytheon SOA vision applied to entire AWIPS (including National Centers and Local Applications) → AWIPS II
- Perform “black-box” conversion off line
- Provide entire new suite of services
- Migrate existing applications to new services (Raytheon + Labs)



AWIPS II Key Features

- Java primary system language
- Layered SOA with container-based services
- Enterprise Service Bus to connect services
- Visualization implemented via Eclipse Rich Client Platform extendable through plug-ins
- System adapts to new data types and transforms with plug-ins
- XML messaging
- Staged Event Driven Architecture (SEDA) clustering for services yields automatic load balancing, load scaling, and fault tolerance for scalability



CHPS Approach to AWIPS II

- Develop CHPS SOA components in parallel with AWIPS II
- CHPS must ultimately be integrated with AWIPS II
- Adapt our software at key AWIPS interface points to use ADE/SDK tools
- OHD to get early look at AWIPS ADE/SDK details late 2006
- OHD to participate in pilot AWIPS application migration project early 2007?



Next Steps...

- It is essential that RFCs are closely involved in the evolution of CHPS
- First meeting of CHPS Acceleration Team last evening
- Strongly desire CAT and RFC assistance with CHPS Realization Plan and implementation decisions
- Please provide feedback on this presentation and as we move forward